Policy, Research, and External Affairs

WORKING PAPERS

International Trade

International Economics Department
The World Bank
March 1991
WPS 610

Can Preshipment Inspection Offset Noncompetitive Pricing of Developing Countries' Imports?

The Evidence from Madagascar

Alexander J. Yeats

Many developing countries pay preshipment inspection firms well to verify that imports (and sometimes exports) meet quality and quantity standards and that prices are within established norms. But preshipment inspection failed to reduce the excessive import prices Madagascar was paying (particularly for chemicals and basic manufactures), possibly as the result of false invoicing by Madagascar importers and industrial country exporters.

Policy, Research, and External Affairs

WORKING PAPERS

International Trade

WPS 610

This paper — a product of the International Trade Division, International Economics Department — is part of a larger effort in PRE to improve developing countries' ability to make more effective use of their financial resources in the procurement of imports vital to industrialization and growth. Copies are available free from the World Bank, 1818 H Street NW, Washington DC 20433. Please contact Jean Jacobson, room S7-037, extension 33710 (31 pages).

Many developing countries use preshipment inspection (PSI) firms to counter the adverse effects on their foreign trade of certain pricing and business practices. These firms may also perform some national customs functions, but their key responsibility is normally to verify that imports (and sometimes exports) meet quality and quantity standards and that prices are within established norms.

Developing countries make substantial payments for PSI — charges appear to average about 1 percent of the value of the goods inspected — but have undertaken no comprehensive cost-benefit studies of PSI.

Using data from Madagascar's experience, Yeats analyzes the impact of PSI on Madagascar's relative import prices. The results suggest that Madagascar paid considerably higher prices than other developing and industrial countries both before and after PSI was adopted.

In other words, preshipment inspection failed to reduce Madagascar's import prices to the level of those paid (on average) by other importers. Extreme prices (150 percent or more above average) occur for all types of goods imported by Madagascar but are clustered in chemicals (SITC 5) and basic manufactures (SITC 6).

Evidence suggests that collaborative false invoicing by Madagascar importers and industrial country exporters is one reason for the excessive prices both before and after adoption of PSI.

Can Preshipment Inspection Offset Noncompetitive Pricing of Developing Countries' Imports? The Evidence from Madagascar

by
Alexander J. Yeats

Table of Contents

Can Preshipment Inspection Offset Noncompetitive Pricing of Developing Countries' Imports: The Evidence from Madagascar

Alexander J. Yeats[1]

I. Introduction

While numerous theoretical and empirical studies have examined the positive contribution that trade makes to developing countries' industrialization and growth, several recent investigations suggest that the conditions under which some trade occurs may restrict its positive effects. For example, a World Bank analysis of European countries' prices for iron and steel goods showed former African colonies pay 15 to 25 percent more, on average, for imports than other industrial or developing countries, and that these adverse price differentials persisted over (at least) the last three decades.[2] In addition, previous analyses of discrepancies in partner-country trade statistics provide evidence on the existence of illegal practices such as smuggling and false invoicing to evade tariffs or other restrictions, or to effect capital flight.[3] Cases have

---

[1]Principal Economist, International Economics Department, The World Bank, Washington 20433. The views expressed in this paper need not reflect those of the World Bank, its management, or its member countries.

[2]See Yeats (1990) for details. Factors which appeared to be responsible for the adverse price differences include the small size of the African countries relative to other importers, and the lack of aggressive competition by exporters. In a related study Hufbauer and O'Neill (1972) also show that small countries typically pay more for imports. Avramovic (1978) determined that market imperfections, as well as a lack of finance and countervailing power, result in developing countries generally receiving less than developed countries for exports.

[3]For example, Bhagwati (1967) and Sheikh (1974) use partner-country trade data to show how Indian and Pakistani exporters inflate invoices to illegally secure export subsidies. Simkin (1970) uses the same approach to assess the level of smuggling and noncompliance with international commodity agreements in Africa. See Ely (1961) and Morgenstern (1963) for a general discussion of factors causing discrepancies in partner-country trade data.

also been cited (see Helleiner, 1978 or Edwards, 1972) where transnational corporation practices, international cartels pooling and allocation of patents, trademarks and copyrights, allocation of territorial markets and other restrictive business practices reduced competition in import and export markets and developing countries' gains from trade.

In an attempt to offset the detrimental effects of such practices, a growing number of developing countries have engaged the services of preshipment inspection (PSI) firms to verify that the quality and quantity of goods shipped meets contractual standards and that the prices charged are within "reasonable" norms.[4] Considerable costs are involved as the United States International Trade Commission (1987) estimates the PSI companies' charges average about three

[4]A tabulation by the U.S. International Trade Commission (1987, p. 1-4) indicates the following countries were using pre-shipment inspection services as of December 1986 (starting date in parentheses): Angola (1980), Bolivia (1986), Burundi (1978), Congo (1987), Ecuador (1985), Equatorial Guinea (1983), Ghana (1971), Guatemala (1986), Guinea (1986), Haiti (1983), Indonesia (1985), Côte d'Ivoire (1975), Jamaica (1986), Kenya (1972), Liberia (1986), Madagascar (1983), Mexico (1985), Nigeria (1984), Paraguay (1983), Philippines (1986), Rwanda (1977), Suriname (1982), Tanzania (1972), Uganda (1982), Venezuela (1986), Zaire (1968), and Zambia (1978). The Societe General de Surveillance (SGS) was the PSI firm being employed exclusively by all but four (Congo, Guinea, Nigeria and Venezuela) of these countries.

quarters to one percent of the value of goods inspected.[5] Proponents argue (see Mowbray (1988), Dornbusch (1987), or Societe General de Surveillance (1989) that the service is cost effective since preshipment inspection prevents price gouging by sellers and false invoicing to avoid tariff and tax liabilities or effect capital flight, combats shipment of substandard goods or items that otherwise fail to meet contractual requirements, and can be used to verify that excessive freight charges are not levied on imports (see Societe General de Surveillance (1988)).

In spite of the importance of these problems, and the claims concerning the utility of PSI for dealing with them, there appear to have been no comprehensive analyses aimed at evaluating the performance and results of preshipment inspection. The present study provides some relevant information by analyzing Madagascar's relative import prices before and after PSI requirements were adopted. In particular, an attempt is made to determine if Madagascar paid "inflated" prices for some goods and, if so, how effective preshipment inspection was in countering this problem. Also, statistics relating

---

[5]The PSI companies focus almost exclusively on imports, although they have been employed for some export products, especially when subsidies and other incentives are offered. While the actual services performed differ from country to country, the normal PSI contract covers the following 14 basic points: (1) the purpose of the contract; (2) the nature and scope of the inspection services to be rendered; (3) obligations regarding comparison of prices; (4) obligations of the contracting government; (5) identification of the goods subject to inspection and those to be exempt; (6) special procedures regarding inspections of goods from certain countries; (7) exempt transactions; (8) reporting requirements; (9) obligations of the inspection company and vendors; (10) fees and other charges; (11) method of payment; (12) liability; (13) resolution of disputes between the contractor and government; and (14) term of the contract. Regarding point (6), exports from the (former) socialist countries of Europe and Asia and other developing countries are generally exempt from inspection, although some Eastern European countries are covered by Madagascar's contract.

to false invoicir · are analyzed to determine if PSI was effective in combatting capital flight or customs duty avoidance.

II. Scope and Methodology of the Study

Madagascar was chosen as the subject of the present investigation for several reasons, including the fact that the preshipment inspection progr. . with SGS was adopted in 1983 and the required data were available to assess the effects of the program for its first five years of operation.[6] Madagascar was also selected due to the comprehensive nature of its preshipment inspection requirements--inspections are performed on virtuall·· all imports of general merchandise, equipment and materials, most types of machinery (especially that destined for "infrastructure, industrial, and agro-industrial projects.")[7] Imports valued under 4 million Malagasy francs (about US$5,900 at 1986 average rates of exchange) are, however, exempted from inspection. The choice of Madagascar was based on claims concerning the program's effectiveness and

---

[6]See USITC (1987, pp. 3-81 to 3-86) for a general discussion of the features of Madagascar's program which began on 1 June 1983. Appendix Table 3 lists countries where PSI of exports to Madagascar is required. The cost of the program is estimated by USITC to be about 1.4 percent of the f.o.b. value of each import license.

[7]Products exempted include: gold; precious stones; works of art; explosives and fireworks; munitions, weapons and instruments of war; live animals; fresh, frozen, or refrigerated fish; eggs; fresh, refrigerated, or frozen meat; fresh, refrigerated, or frozen fruit and vegetables; salvage metals; personal belongings and household goods, including one used vehicle; current newspapers and periodicals; imports through the mail; gifts; supplies for diplomatic and consular missions; and supplies for agencies of the United Nations that are imported for their own needs. Instead of listing countries exempted from inspections, the contract lists countries where inspections are to be performed (This list can be found in Appendix Table 3.) Another exemption is that the price comparison is not required for raw petroleum and petroleum products delivered in bulk. Only quantity and price inspections are required for pharmaceutical products, dyes, paints, insecticides, pesticides and fungicides, special chemical products, cosmetics, wines (except in bulk) and brand-name spirits. Special chemical products are defined as any chemical product produced exclusively by a given manufacturer with a confidential or protected trademark.

savings--the General Director of Foreign Trade for Madagascar has stated that inspections save the country a minimum of FMG 500 million (about US$740,000) annually although no indication was given as to how this estimate was derived.[8] Finally, Madagascar's imports largely originate in a relatively few industrial countries (with France by far the most important, see Table 1) which, with the exception of the United States, compile the detailed value and quantity trade statistics required for this analysis.

Table 1: The Origin of Madagascar's Imports - Major Product Groups, 1979-86

Product Category (SITC)	Year	All imports ($ millions)	Share of Madagascar's imports originating in (%)							
				European Community (10)						
			Total	France	Germany	Italy	U.K.	Japan	EFTA	USA
All Goods (0 to 9)	1986	373.6	47.8	31.3	6.7	2.8	3.2	6.5	2.6	10.7
	1985	465.1	46.6	29.4	5.6	2.0	4.6	2.7	1.7	16.2
	1983	411.5	51.6	35.5	4.3	3.9	2.6	4.1	1.8	8.6
	1981	473.0	61.9	37.6	10.0	5.1	2.7	3.1	6.4	4.4
	1979	698.4	48.5	30.0	8.6	3.8	1.9	5.5	2.8	10.0
Manufactures (6 to 8 less 68)	1986	176.5	70.1	44.9	10.2	4.3	6.5	9.1	2.7	9.9
	1985	252.4	58.5	36.3	7.4	3.1	7.0	4.6	1.5	26.4
	1983	193.1	72.0	49.0	6.7	5.9	5.3	3.2	1.9	11.1
	1981	293.7	66.4	40.7	12.0	5.7	3.2	4.5	9.2	3.7
	1979	377.3	56.9	35.3	11.0	4.1	3.1	9.4	3.5	16.5
Chemicals (5)	1986	47.0	73.8	52.1	11.5	3.8	0.6	1.5	7.4	4.9
	1985	49.0	83.0	57.6	11.0	2.0	6.3	1.6	5.9	3.2
	1983	41.6	82.5	62.7	7.2	3.1	1.0	3.1	7.5	1.4
	1981	45.5	84.2	54.5	14.3	4.6	3.5	0.9	5.9	2.2
	1979	76.8	77.0	44.4	20.2	4.3	0.9	0.8	5.6	1.7
Foods (0+1+22+4)	1986	56.9	19.5	12.5	1.0	0.7	0.2	13.5	0.5	33.4
	1985	58.5	25.0	9.9	0.9	0.2	1.2	--	0.3	9.6
	1983	82.3	25.0	12.0	0.4	3.0	0.1	11.4	0.2	14.5
	1981	66.6	52.3	33.5	5.0	0.6	1.7	--	0.9	6.4
	1979	105.5	34.6	27.1	0.6	0.2	0.9	--	0.3	4.2

Source: Madagascar's reported imports as recorded in United Nations Series D Trade Tapes.

[8]Published statements from Midi Madagasikara, February 16, 1987.

As a first step, annual value and quantity data were drawn from UN Series D trade tapes for French, German, Italian and Japanese exports to Madagascar over the 1979-1988 period and unit values were computed. This provided a "benchmark" on average prices (unit values) paid for the four years (1979-82) prior to the adoption of PSI as well as five full years (1984-1988) afterwards. In general, the data were drawn at the very detailed five-digit SITC (Revision 2) level although some four-digit products were included in the Italian, German and Japanese statistics when more disaggregated data were not available.[9] Value and quantity data were also drawn for exports of these products to other developing and industrial countries so Madagascar's relative import prices could be

[9]The selection generally included every five-digit product exported to Madagascar over most of the 1979-88 period for which both quantity and value data were available. Certain products, such as those traded irregularly, or which clearly had diverse characteristics (i.e., five-digit items with "not elsewhere classified" or "not elsewhere specified" headings) were excluded. Data on United States exports were not used since this country generally did not compile quantity information required for computation of unit values. A point to note concerning the unit value information is that quality or product-mix variations may make price comparisons unreliable for some specific products, but their influence should cancel out in the large number of products included in this study (i.e., there is no reason to believe that Madagascar is generally a purchaser of relatively high- or low-priced goods). See Appendix 1 for separate price comparisons for goods with homogenous characteristics.

computed.[10] This procedure produced free-on-board export prices for similar goods shipped from the four industrial countries to Madagascar and other destinations.

Table 2 provides summary statistics on Madagascar's relative prices (expressed as a percentage) for each year over 1979-88. Both simple and trade-weighted (by Madagascar's import values) average prices are shown for shipments from France, Germany, Italy and Japan, along with similar statistics for these

---

[10]Several modifications were made in the comparator country groups. Since some Sub-Saharan African countries use pre-shipment inspection, and a study by Yeats (1990b) showed their import prices were not representative of those paid by other countries, they were excluded from the developing country group. Also, Greece, Spain and Portugal were included in the industrial country group even though they are categorized as "developing" in some World Bank classifications. These tabulations permitted calculation of Madagascar's relative import price (R_m) for each five-digit product i ,

$$(1) \quad R_{mi} = \frac{V_{mi}}{Q_{mi}} \times \frac{Q_{ci}}{V_{ci}}$$

where V_{mi} and V_{ci} are the free-on-board value of imports by Madagascar and the comparator group (i.e., industrial or other developing countries), respectively, and Q is the corresponding quantity.

Table 2: Relative Import Prices Paid by Madagascar and Other Developing or Industrial Countries from Selected Exporters, 1979-88
(percentage)

Exporter	Price Comparator/Average		1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
France	Industrial Countries	- Weighted[c]	34.7	42.1	38.5	44.0	37.6	27.8	29.0	34.3	56.5	23.3
		- Simple	78.6	84.8	119.2	93.1	63.7	64.6	35.2	94.3	106.6	49.4
France	Developing Countries[b]	- Weighted[c]	36.1	28.4	23.3	29.6	31.8	15.0	13.9	22.4	40.3	18.1
		- Simple	58.9	48.8	69.1	72.6	56.7	36.7	8.2	56.3	45.8	33.3
Germany	Industrial Countries	- Weighted[c]	71.1	78.1	41.7	120.3	154.9	79.9	88.2	81.9	76.7	73.2
		- Simple	110.4	91.3	75.4	115.9	130.4	103.6	98.3	86.7	106.5	72.1
Germany	Developing Countries[b]	- Weighted[c]	38.6	48.9	27.2	53.8	72.6	48.6	49.5	51.3	43.9	37.8
		- Simple	64.0	61.9	53.8	79.2	131.1	75.2	69.5	57.1	88.6	48.2
Italy	Industrial Countries	- Weighted[c]	59.0	129.4	36.2	111.6	72.7	47.6	45.7	40.1	54.4	[a]
		- Simple	38.8	30.7	28.7	113.0	99.9	36.8	14.2	32.6	37.6	[a]
Italy	Developing Countries[b]	- Weighted[c]	46.4	98.7	37.4	80.4	73.6	43.4	39.6	39.6	46.0	[a]
		- Simple	42.6	21.5	35.0	111.3	82.9	42.9	17.5	32.9	38.2	[a]
Japan	Industrial Countries	- Weighted[c]	71.6	32.7	172.3	85.0	133.7	75.0	62.2	107.3	36.3	68.6
		- Simple	62.3	95.7	202.7	89.4	163.4	134.3	112.6	248.2	192.5	150.4
Japan	Developing Countries[b]	- Weighted[c]	93.9	63.2	163.3	105.0	107.6	53.7	66.0	102.9	68.2	75.0
		- Simple	116.1	142.7	199.9	129.5	173.8	165.7	128.2	210.9	218.5	186.4
ALL ABOVE	Industrial Countries	- Weighted[c]	45.6	56.0	46.9	66.3	67.6	42.9	42.8	41.2	56.4	29.8[a]
		- Simple	78.2	77.0	95.6	101.7	93.6	74.1	52.6	92.5	99.8	67.9[a]
ALL ABOVE	Developing Countries[b]	- Weighted[c]	40.9	40.5	33.7	43.0	47.5	29.8	27.1	39.4	40.6	22.9[a]
		- Simple	61.8	55.2	64.4	87.0	77.7	60.0	35.3	64.6	70.3	55.3[a]

[a] Price comparisons for Italy could not be made for 1988 due to a lack of quantity information on exports.

[b] For definition of developing countries see footnote 10.

[c] Weighed by Madagascar's import values.

Source: United Nations Series D Trade Tapes.

four countries combined.[11] As such, Table 2 indicates the extent to which Madagascar's annual import prices exceeded other countries (positive numbers show such a percentage price premium) while any negative values (a discount) would show the percentage by which they were lower.

Table 2 indicates Madagascar always paid a substantial price premium for imports--irrespective of whether comparisons are made with industrial or other developing countries. The lowest observation, based on 1985 French prices, indicates a Madagascar premium of 8 percent over similar goods shipped to developing countries, but in most years the relative prices are far higher. In fact, several comparisons, such as those for Germany's or Japan's 1982 and 1983 exports show Madagascar's import prices were more than double those of other developing countries, while Japan's 1981 (trade-weighted) prices were 200 percent higher.

---

[11]Specifically, Madagascar's unweighted average relative import price was derived from:

$$(2) \qquad U_m = \frac{\Sigma \frac{V_{mi}}{Q_{mi}} \times \frac{Q_{ci}}{V_{ci}}}{N}$$

where the V and Q terms are defined in equation (1) and N is the number of five-digit goods shipped.

The trade-weighted average (W_m) is defined by:

$$(3) \qquad W_m = \frac{\Sigma \frac{V_{mi}}{V_{mt}} \times \left(\frac{V_{mi}}{Q_{mi}} \times \frac{Q_{ci}}{V_{ci}} \right)}{N}$$

where V_{mt} represents Madagascar's total imports of the five-digit products.

Two other points of importance are evident from Table 2. First, the trade-weighted price relatives are consistently lower than the simple averages (see also Table 3) which implies Madagascar pays lower relative prices on larger purchases. Since Yeats (1990b) and Hufbauer and O'Neill (1972) report similar findings it suggests procedures such as bulking domestic orders, or making joint purchases with other countries may result in lower prices. Second, the average price relatives are almost always higher when industrial countries are the comparator group--a point that indicates developing countries typically pay higher prices for similar products (see Yeats (1990b, Table 4 on page 10 for related findings). (This is not so often the case for Japan as for the European countries.)

Table 3 is addressed to the key question of this investigation--does the evidence suggest that preshipment inspection improved (lowered) Madagascar's relative import prices.[12] Specifically, the table shows Madagascar's average (weighted and unweighted) price relatives before and after PSI was adopted. In the 1984-88 period (when PSI was required), Madagascar's (trade-weighted) import prices averaged 43 percent more than those of industrial countries (unweighted average prices were about 77 percent higher) and were about one-third higher than other developing countries. Although these averages are down somewhat from the pre-PSI period, the differences are not statistically significant at the 95

[12]It should again be stressed that the present tests only relate to the impact of PSI on import prices--they do not show how well (or poorly) PSI fulfills other objectives such as speeding goods through customs, insuring that goods meet contractual standards, improving customs' revenue collection, or ensuring that quantities shipped are correct, etc. It would be difficult to undertake such evaluations using United Nations trade data, rather an on-site assessment of PSI is required.

Table 3: Average Price Premia Paid by Madagascar for Imports from France, Germany, Italy and Japan Before and After the Adoption of Pre-Shipment Inspection Requirements

Price Comparator/Average		Intervals Before and After PSI Requirements: Before (1979-82)	After (1984-88)[b]	
Industrial Countries[a]	- Weighted	53.7	42.6	(45.8)
	- Simple	88.1	77.4	(79.8)[c]
Developing Countries	- Weighted	39.5	32.0	(34.2)
	- Simple	67.1	57.1	(57.6)[c]

[a] France, Germany, Italy and Japan, Italy excluded in 1988.
[b] Figures in parentheses are for 1984-87. The other 1984-88 averages do not include 1988 Italian prices. See the notes to Table 2.
[c] Not significantly different from the 1979-82 average at the 95 percent confidence level. Significance tests were not run on the weighted averages.

percent level (i.e., the data do not indicate that preshipment inspection led to statistically significant price reductions). A further point is that the improvement in 1984-88 relative prices reflected in Table 3 would be expected due to economic reforms adopted by Madagascar during this period (see footnote 13).

While Madagascar's average relative import prices did not improve under PSI, there may have been some influence on their overall distribution. Specifically, it is possible that the averages basically remained the same in the pre- and post-PSI periods but the frequency distribution changed. Such could

be the case if PSI reduced cases where extreme price differences (say 100 percent or more) occurred, or if the variance in prices about the mean were lowered.[13]

Table 4 summarizes information on the distribution of Madagascar's relative import prices during 1979-82 and 1984-88. Shown here are decile values for import price relatives from France, as well as for Germany, Italy and Japan combined. That is, the table entries corresponding to any given D_i indicates that 10_i percent of all Madagascar's price relatives fell below the value shown while $(100-10_i)$ percent were higher.[14]

As Table 4 shows, PSI had little or no influence on the frequency of extreme relative price differences. In both the 1979-82 and 1984-88 periods, 10 percent of all French exports to Madagascar had unit prices of 150 percent or more above those paid by industrial countries--a pattern very similar to that

---

[13]A potential limitation of the approach employed in this paper is that all improvements in relative import prices are attributed to the adoption of PSI, when they in fact may be due to other factors which lowered incentives for false invoicing and capital flight. According to the World Bank (1989), Madagascar undertook several major reforms in the 1984-88 period that should have, on balance, lowered its relative import prices. In 1987 and 1988, a market-determined trade and foreign exchange regime was adopted that included the elimination of quantitative import restrictions and also simplified (reduced) tariffs. While economic growth sharply deteriorated between 1980 and 1982, financial stabilization and a limited expansion were achieved from 1983 through 1988. These developments should have improved Madagascar's "credit worthiness" and reduced finance and insurance costs for imports. Since the latter are reflected in exporter's f.o.b. unit values they should have reduced 1984-88 relative import prices. Evidence also suggests that the black market exchange rate dropped in 1984-88, a development that should have had a positive impact on import prices. See Pryor (1988, Table G-2, p. 37) for estimates of the black market premium.

[14]As an example, Table 4 shows (see the entry corresponding to D_8) 20 percent of French 1979-82 exports to Madagascar had unit values 116.9 percent or more higher than similar goods exported to industrial countries. In 1984-88, 20 percent of these shipments had unit values that were 112.3 percent higher. Table 4 indicates the other industrial countries' (Germany, Italy and Japan) distribution was even more skewed toward high relative unit values--in 1979-82 20 percent of Madagascar's import values exceeded those for industrial countries by 140.8 percent or more.

Table 4: Analysis of Relative Import Prices Paid by Madagascar Before and After Adoption of Preshipment Inspection Requirements
(Data correspond to relative prices at decile limits)

Decile	France				Germany, Italy and Japan			
	Comparator:Industrial		Comparator:Developing		Comparator:Industrial		Comparator:Developing	
	1979-82	1984-88	1979-82	1984-88	1979-82	1984-88	1979-82	1984-88
D_1	-29.1	-43.7	-38.3	-50.7	-39.5	-48.9	-40.8	-45.4
D_2	-9.6	-24.4	-20.0	-39.8	-20.5	-30.0	-18.6	-26.6
D_3	6.3	-4.3	-3.3	-21.8	-5.2	-17.2	-3.3	-8.7
D_4	20.4	10.7	8.2	-6.0	11.8	3.1	12.0	8.1
D_5	36.9	26.1	19.2	9.7	31.0	21.5	28.6	22.3
D_6	51.6	42.0	33.7	25.3	59.3	40.5	51.8	41.7
D_7	78.4	65.8	52.1	44.2	92.1	79.6	79.7	68.3
D_8	116.9	112.3	77.9	69.8	140.8	126.5	112.5	112.5
D_9	151.7	151.3	137.3	120.7	152.2	151.8	151.6	151.6

Note: The decile limits show the proportion of Madagascar's relative import prices that lie above or below certain values. For instance, during the 1979-82 period exactly half (50 percent) of Madagascar's import prices from France were 36.9 percent higher than those charged industrial countries while half were lower. Similarly, 30 percent of Madagascar's prices were 78.4 percent higher.

for Germany, Italy and Japan's prices. The shifts that occurred were in the lower deciles (i.e., the entries corresponding to D_1 through D_3 ranges).[15] The table also shows that some reduction occurred in the median relative import prices--entries that correspond to the D_5 values--due to an increase in the number of products with an apparent price discount. However, tests on the mean prices (previously cited) indicate the reduction was not significant.

[15]A Chi-square test indicates that the 1979-82 distribution of relative import prices was significantly different from the 1984-88 distribution at the 95 percent confidence level. However, as Table 4 shows this is due to shifts in the middle and lower decile ranges and not to reduction in extreme adverse price relatives, i.e., those above the D_9 limit.

III. The Industry Pattern of Relative Prices

Several important questions concern the product groups in which the extreme price relatives occu·--in particular, are they clustered in sectors where preshipment inspection is not required (see footnote 7 for information on this point), do they flag industries where PSI is less effective (possibly due to complex or secret pricing practices), are they in less-competitive sectors where monopoly pricing is a factor, or is there evidence they result from collaborative false invoicing by buyers and sellers. Using data on French exports, Table 5 allows examination of the distribution of these extreme price relatives before and after PSI was adopted. The table shows the percentage of extremes in each major one- and two-digit SITC group and also indicates Madagascar's overall import price relativity.[16] Finally, the table also gives the value of Madagascar's imports in each product group.

Table 5 shows that the extreme price relatives are heavily clustered within chemicals (SITC 5) and basic manufactures (SITC 6), and that the introduction of PSI did little to change their distribution or frequency of occurrence. During 1984-88, 36 percent of all extremes occurred for chemicals (up 2 points from 1979-82) with over two-fifths of these observations in inorganic chemicals

---

[16]In 1979-82 there were 94 five-digit SITC products which had "extreme" price relatives (150 percent or more difference between Madagascar's and other countries' prices) while there were 111 such observations during 1984-88. The expenditure discount or premium measure ($E_{d/p}$) reported in Table 5 shows the percentage difference between Madagascar's actual and potential expenditure if the same quantity of imports were purchased under other countries' prices,

$$(4) \qquad E_{d/p} = \left(\frac{\Sigma p_m q_m}{\Sigma p_d q_m} - 1 \right) \times 100$$

A positive value shows the percentage "excess payment" associated with Madagascar's higher import prices.

Table 5: The Distribution of Madagascar's Import Price Premiums or Discounts and Extreme Relative Import Prices

SITC	Description	Value of French Exports ($ millions) 1979-82	Value of French Exports ($ millions) 1984-88	Madagascar's expenditure discount or premium (%)[a] 1979 to 1982	Madagascar's expenditure discount or premium (%)[a] 1984 to 1988	Percentage of extreme price relative values in group[b] 1979 to 1982	Percentage of extreme price relative values in group[b] 1984 to 1988
0	FOOD AND LIVE ANIMALS	62.2	40.7	-35.8	6.2	0.0	0.9
2	CRUDE MATERIALS EXCEPT FUELS	16.8	22.5	1.3	8.2	3.2	3.6
3	MINERAL FUELS	22.7	4.7	44.5	42.1	1.1	0.0
4	ANIMAL AND VEGETABLE OILS	2.1	0.8	36.4	77.8	0.0	3.6
5	CHEMICALS	111.8	112.7	42.3	27.1	34.0	36.1
	of which:						
51	Organic Chemicals	8.5	6.7	63.9	43.1	9.6	9.0
52	Inorganic Chemicals	12.5	5.5	38.0	3.4	13.7	15.4
54	Medicinal Products	52.9	38.2	51.0	54.1	1.1	0.9
58	Plastic Materials	9.4	22.1	17.8	14.3	5.3	4.5
59	Chemicals, nes	22.6	23.8	22.9	26.0	4.3	6.3
6	BASIC MANUFACTURES	155.7	125.1	21.9	14.5	34.1	33.3
	of which:						
62	Rubber Manufactures	21.6	18.7	45.3	7.2	1.1	1.8
64	Paper and Manufactures	9.5	10.5	26.8	33.9	5.3	5.4
65	Textile Yarn and Fabrics	15.3	16.1	-11.3	-15.8	4.3	7.2
66	Nonmetal Mineral Manufactures	9.3	11.2	20.8	1.0	4.3	3.6
67	Iron and Steel	52.0	35.3	21.2	19.9	2.1	1.8
68	Nonferrous Metals	6.4	4.3	43.8	26.8	7.4	8.1
69	Metal Manufactures, nes	39.1	27.9	-6.8	-3.6	9.6	5.4
7	MACHINERY AND TRANSPORT EQUIPMENT	311.9	264.3	19.4	18.2	14.9	13.5
	of which:						
71	Power Generating Equipment	37.0	27.4	17.4	21.2	0.0	1.8
72	Machines for Special Industries	104.5	45.1	21.3	3.2	6.4	3.6
74	General Industrial Machinery	50.2	45.1	-22.8	-41.0	2.1	1.8
75	Office Machines and Equipment	6.8	13.0	20.5	1.8	2.1	0.9
76	Telecommunications Equipment	23.4	16.6	29.5	29.0	1.1	0.0
77	Electrical Machinery nes	36.1	44.9	9.8	8.6	3.2	5.4
8	MISC. MANUFACTURED GOODS	36.0	38.2	19.4	16.9	12.7	9.0
	of which:						
82	Furniture	1.2	1.0	-4.6	26.8	2.1	0.0
84	Clothing	1.7	1.4	-34.2	-2.7	2.1	1.8
87	Precious Instruments	9.9	11.4	51.2	12.6	1.1	1.8
89	Misc. Manufactures	16.7	16.4	31.2	-30.4	7.4	5.4

[a] Defined as the actual payment made by Madagascar for items in the group divided by the payment required if Madagascar faced industrial country prices with the result expressed as a percentage. Algebraically, this represents,

$$E_{d/p} = \left(\frac{\Sigma\, p_m q_m}{\Sigma\, p_d q_m} - 1 \right) \times 100$$

where p_m and p_d are prices paid by Madagascar and industrial countries, respectively, and q_m is the quantity of Madagascar's imports. The computations are based on products for which five-digit unit values were computed. See Table 2.

[b] Observation falling in the top decile of Table 4, i.e., items with a Madagascar price relative exceeding 150 percent.

Note: No extreme price relatives fell in the following two-digit SITC groups - SITC 53 (Dyes and Tanning Products); SITC 73 (Metalworking Machinery); SITC 81 (Plumbing and Lighting Fixtures); SITC 85 (footwear); SITC 88 (Photographic Equipment and Supplies).

(SITC 520). Preshipment inspection is required for almost all Madagascar's imports of products classified in SITC 5 and 6 (some specialty chemicals are excluded--see footnote 7) so the data do not suggest that extreme prices occur primarily where PSI is absent.

A second possible cause of industry differences in relative import prices is collaborative false invoicing by foreign exporters and Madagascar importers. This potential explanation recognizes that the incentive to over- or underinvoice depends on the relative height of the foreign exchange black market premium and the tariff rate. If the black market premium is relatively high this encourages overinvoicing to facilitate capital flight, while a relatively high tariff encourages underinvoicing to minimize import duties.[17] Expressed algebraically, if t_i is the nominal tariff, p is the black market premium (measured as a percentage above the official exchange rate), V_t is the true value of imports, and V_f is the falsified invoice price, then the importer's net gain (or loss) on product i (N_i) will equal,

$$(5) \qquad N_i = t_i (V_t - V_f) - p(V_t - V_f)$$

or,

---

[17]For example, if the tariff is 70 percent and the value were underinvoiced by 25 percent, the importer actually pays a 52.5 percent duty. This assumes, however, that the importer can obtain foreign exchange to finance that part of the import bill which is underinvoiced. If exchange controls exist, the extra foreign exchange must be purchased on the black market at a premium over the official rate. In this situation underinvoicing is profitable if the tariff exceeds the black market premium. It follows that goods with very high tariffs--say 100 percent or more--are the most likely to be vehicles for tax evasion by underinvoicing. It should also be noted that the statistical tests presented in this paper, which are based on French export unit values, assume that exporters and importers collaborate on the false invoicing. It may be that the misinvoicing is done solely by importers (if it occurs) and the French export data accurately reflect relative prices charged.

$$(6) \qquad N_i = (t_i - p)\ [V_t - V_f]$$

Equation (6) shows that if $p > t_i$ importers have an incentive to overinvoice, $V_f > V_t$. If $p < t_i$ the incentive operates in the reverse direction. According to Pryor (1988, p. 37) Madagascar's black market premium ranged from 50 to 70 percent during 1982-84. Appendix Table 2 gives tariff rates for different imports.

Since as equation (6) shows, the relative level of tariffs and the black market premium determine the direction of incentives for false invoicing, data on the level of Madagascar's tariffs and related import charges were drawn from an UNCTAD (1987) report. This source gives nominal import duty averages for many SITC (Revision 2) products down to the five-digit level. Using these statistics, items were ranked by decreasing tariffs and two groups selected. The first was composed of high tariff items (import duties for this group ranged from 40 to 131 percent--see Appendix Table 2) while the second consists of products with relatively low (15 percent or under) tariffs and special import charges.[18] Next, Madagascar's average relative import price was computed for each group before and after PSI was adopted. The results are reported in Table 6.

---

[18]The complete list of products included in these two groups along with their corresponding SITC (Rev. 2) codes and nominal tariffs is presented in Appendix Table 2. Over the period covered by these tests Madagascar's black market premium and tariffs changed in ways that would be offsetting. In 1987 and 1988 import tariffs were simplified and reduced and quantitative restrictions eliminated. According to estimates by Pryor (1988, p. 37) government policies restored economic growth and cut the black market exchange rate by about one-third from its 1978-80 level.

Table 6: Relative Import Prices for High and Low Madagascar Tariff Products: Based on Statistics Reported by Industrial Countries (Price Relatives Using Industrial Country Comparisons)

Exporter	Low Tariff Products 1979-82	Low Tariff Products 1984-88	High Tariff Products 1979-82	High Tariff Products 1984-88
France	71.3	49.0	66.4	25.9
Germany, Italy and Japan	199.6	75.1	185.1	54.8
All Above	125.0	70.2	98.9	44.6

Note: For all of the above comparisons except France, over the 1979-82 period the low tariff product average price relative is significantly higher (95 percent confidence level) than the high tariff product average. Also, the 1984-88 price relatives for both the high and low tariff products are significantly lower than the 1979-82 figures. The reader should note these results were achieved with a smaller and less representative sample than the findings reported in Table 3.

The data in the table support the proposition that collaborative over-invoicing contributes to product differences in price relatives.[19] In both 1979-82 and 1984-88 low tariff products had significantly higher prices (the 1979-82 pre-PSI difference for French exports was not significant) which is the pattern expected under collaborative false invoicing. Moreover, the spread between the high and low tariff products' price relatives (about 26-percentage points) is

[19]It should be noted that the results are also consistent with other possible explanations. For example, high tariff items are concentrated in labor-intensive sectors where Madagascar has, or could develop, a productive capacity. As such, "potential" competition from domestic producers may moderate foreigners' export prices, as would be the case if "limit" pricing were being practiced (see Yeats, 1976 for a discussion of limit pricing models). Also, the (simpler) labor-intensive, high tariff products may be more "familiar" to customs agents so the potential for inflating their prices is reduced.

almost identical in 1979-82 and 1984-88--an observation that suggests PSI did little to diminish the relative importance of false invoicing.

IV. Summary and Conclusions

To counter the adverse effects of pricing and other trade practices a growing number of developing countries engage preshipment inspection firms to verify quality and quantity standards of traded goods, and to determine if prices are within acceptable norms. The fact that PSI is relatively expensive--costs appear to average about one percent of the value of goods inspected--heightens the need for objective evaluations of PSI.

The present study evaluated one objective of preshipment inspection by analyzing Madagascar's relative import prices before and after PSI was introduced. The following conclusions result:

-- Comparisons with average prices charged industrial and developing countries indicate Madagascar paid a premium for most imported goods before and after PSI was adopted. Moreover, the data show that preshipment inspection failed to bring Madagascar's prices closer to the average for other importers.

-- Madagascar's inflated import prices under PSI involved major associated revenue losses. If Madagascar paid the same <u>average prices</u> as other countries after PSI was adopted the savings for chemicals (SITC 5) and basic manufactures (SITC 6) imported from France alone would be on the order of US$48 to 52 million, with an associated savings of US$3 to 4 million for iron and steel products (see Appendix 1). If the 30 to 40 percent premium Madagascar paid

over 1984-88 is applied to all goods this implies annual losses of US$125 to 150 million.

-- The most extreme overpayments are clustered in chemicals and basic manufactures--areas where preshipment inspection is generally required. Furthermore, there is some (tentative) evidence that collaborative false invoicing exists as import price relatives for high tariff items are significantly below those for low tariff products. However, there are several other alternative hypotheses that could account for this pattern.

This study's findings raise several issues that require clarification. First, there is a need for specifics on the price variation that will pass PSI inspection. Do Madagascar's 30 to 50 percent above-average relative prices fall within the acceptable range for the preshipment inspectors? Would results improve if a conscious effort were made to tighten the range? A related question is whether or not the pricing practices in sectors like chemicals, where the extreme (adverse) price relatives are concentrated, are sufficiently complex and secretive that PSI is likely to be relatively ineffective under existing conditions.

Several issues of importance were not addressed in this study that warrant further research. First, preshipment inspection is often adopted to address nonprice problems. These include shipment of defective goods or goods that fail to meet contractual standards and quantities. In cases, such as Indonesia, preshipment inspection was used to combat graft, corruption and inefficiency in customs services. How effective PSI is in dealing with these key problems will require "on-site" evaluations of PSI operations. Such evaluations should also attempt to determine if there are unintended effects of the inspection program.

Is trade being diverted to suppliers in countries when PSI is not required? Are large consignments being broken up and shipped in smaller units to avoid inspection (which may not be required on imports under a certain value)? Has PSI involved costly new administrative procedures, or has it improved customs procedures and speeded goods through import controls? Are there reasonable alternatives to PSI as it is now conducted? These are the types of issues that should be addressed in further research.

A final point is that consideration should be given to the nature of the service that would best serve the needs of developing countries--is it PSI or assistance with general procurement problems. Specifically, preshipment inspection now focuses on ensuring that the contracting party pays a "reasonable" price for goods from a given country (or receives an adequate price for exports), but does not attempt to identify low(er) cost suppliers. Further assessments of PSI might specifically address this issue by comparing prices actually paid by the contracting country with those charged by alternative suppliers. The data sources and empirical procedures employed in this study could be easily adapted for an evaluation of this question.

References

Avramovic, Dragaslov. 1978. "Common Fund, Why and What Kind." Journal of World Trade Law. 12 (October).

Bhagwati, Jagdish. 1967. "Fiscal Policies, the Faking of Foreign Trade Declarations, and the Balance of Payments." Oxford Bulletin of Economics and Statistics. (February).

Dornbusch, Rudiger. 1987. Over and Underinvoicing: Motives, Evidence and Macroeconomic Implications. Hearings Before the United States International Trade Commission, Investigation No. 332-242. Washington: USITC, monograph. (February).

Edwards, Corwin. 1972. "Barriers to International Competition: Interfirm Competitive Behavior," in R. Hawkins and Ingo Wolter, eds. The United States and International Markets. Lexington, Mass.: Heath.

Ely, J.E. 1961. "Variations Between U.S. and Its Trading Partner Import and Export Statistics." The American Statistician. (April).

Erzan, Refik et. al. 1989. "The Profile of Protection in Developing Countries." UNCTAD Review. 1, No. 1.

Helleiner, G. 1978. World Market Imperfections and Developing Countries. Washington: Overseas Development Council.

Hufbauer, G.C. and J.P. O'Neill. 1972. "Unit Values of U.S. Machinery Exports." Journal of International Economics. vol. 2, pp. 265-276.

Laird, Samuel and Alexander Yeats. 1990. Quantitative Methods for Trade Barrier Analysis. London:Macmillan Press.

McAllister, Harry. 1961. "Statistical Factors Affecting the Stability of the Wholesale and Consumer Price Indexes." In U.S. Congress, Joint Economic Committee Government Price Statistics Hearing. Washington: U.S. Government Printing Office.

Morgenstern, Oskar. 1963. On the Accuracy of Economic Observations. Princeton: Princeton University Press.

Mowbray, Patricia de. 1988. "Foreign Exchange Conservation and Tax Efficiency in Developing Countries: The Economic Case for Pre-Shipment Inspection." The Business Economist 20, no. 1 (Winter) 34-48.

Pryor, Frederic. 1988. "Income Distribution and Economic Development in Madagascar: Some Historical Statistics." World Bank Discussion Paper Number 37. Washington: World Bank.

Sheikh, Munir. 1974. "Underinvoicing of Imports in Pakistan." Oxford Bulletin of Economics and Statistics. (November).

Stigler, George and James Kindahl. 1970. The Behavior of Industrial Prices. New York: Columbia University Press.

Simkin, C.G.F. 1970. "Indonesia's Unrecorded Trade." Bulletin of Indonesian Economic Studies. (March).

Societe General de Surveillance. 1988. Examples of Results Obtained by Preshipment Inspection and Price Comparison. Geneva:SGS (September).

Societe General de Surveillance. 1989. The Validity of SGS Trade Monitoring Programme. Geneva:SGS (March).

UNCTAD. 1987. Handbook of Trade Control Measures of Developing Countries. (UNCTAD/DDM/Misc.2) Geneva:UNCTAD.

United States International Trade Commission. 1987. Preshipment Inspection Programs and Their Effects on U.S. Commerce. Washington:USITC Publication No. 2003 (August).

Walter, Ingo. 1987. "The Mechanism of Capital Flight." In Donald Lessard and John Williamson, eds. Capital Flight and Third World Debt. Washington: Institute for International Economics.

World Bank. 1989. Trends in Developing Economies 1989. (Washington: World Bank). "Madagascar." pp. 254-259.

Yeats, Alexander. 1976. "A Framework for Analyzing Potential Competition in Financial Mergers and Acquisitions." Journal of Money Credit and Banking. (August).

Yeats, Alexander. 1978. "On the Accuracy of Partner Country Trade Statistics." Oxford Bulletin of Economics and Statistics. (November).

Yeats, Alexander. 1990a. "On the Accuracy of Economic Observations: Do Sub-Saharan Trade Statistics Mean Anything?" World Bank Economic Review 4, No. 2 (May) 135-156.

Yeats, Alexander. 1990b. "Do African Countries Pay More for Imports?...Yes." World Bank Economic Review 4, No. 1 (January) 1-20.

Appendix 1

Analysis of Madagascar's Relative Import Prices and Expenditure Effects for Five-Digit SITC Iron and Steel Products

1979-82 and 1984-88

While the preceding analysis employed unit values for all types of goods exported to Madagascar--some of which may be subject to product-mix changes--there are several product categories where this factor's influence is thought to be small. Specifically, studies by Stigler and Kindahl (1979), McAllister (1961) and others used iron and steel unit values to assess the accuracy of price quotations employed by the United States Bureau of Labor Statistics for the U.S. Wholesale Price Index, while Yeats (1978) (1990b) employed similar information to identify factors producing differences in international transaction prices. As such, it appears useful to determine if Madagascar's relative prices for these homogenous products follow the same pattern as other goods' prices before and after the adoption of preshipment inspection.

Appendix Table 1 provides information on each five-digit SITC (Rev. 2) iron and steel product imported by Madagascar for which 1979-88 quantity and value data were available. The table shows the value of Madagascar's imports of each item from France in the pre- and post-PSI periods as well as the average unit value for these shipments.[1] For comparison, unit values for French exports to other developing and industrial countries are also shown. Finally, a summary measure of the expenditure effects of the differences in relative prices was computed. This measure shows the expenditure gain or loss on imports if Madagascar paid the same average prices as other countries. Stated algebraically,

---

[1]An attempt was made to compile similar data for other suppliers, i.e., Germany, Italy and the United Kingdom. Two problems were encountered with the major difficulty being that Madagascar primarily imports ferrous metals from France. Also, the other European countries generally did not provide export data at the same level of detail (i.e., for five-digit iron and steel products) and some quantity data required for computation of unit values were missing.

Appendix Table 1: Comparative Import Prices and Expenditure Effects for Five-Digit Iron and Steel Products Imported from France

SITC	Descriptions	Years	French exports to Madagascar		French unit values for exports to other countries		Implied Madagascar gains or losses based on other's prices ($000)[a]	
			Value ($000)	Unit value ($)	Developing	Industrial	Developing	Industrial
--	ALL SAMPLED STEEL ITEMS[b]	1979-82	28,212	513.62	434.73	377.84	-4,855	-6,969
		1984-88	19,131	530.61	406.01	446.71	-4,188	-2,797
673.26	Iron and Steel Hot-Rolled Bars	1979-82	9,195	418.77	351.94	358.21	-1,467	-1,330
		1984-88	3,238	359.34	282.81	313.63	-690	-416
673.27	Iron and Steel Forged Bars	1979-82	244	983.87	1,040.54	767.63	14	-54
		1984-88	229	978.63	667.92	512.73	-73	-109
673.31	Iron and Steel Small U.I.H. Sections	1979-82	138	572.61	650.88	535.25	19	-9
		1984-88	179	471.05	473.84	483.89	1	5
673.32	Iron and Steel Large U.I.H. Sections	1979-82	1,436	460.11	357.12	366.58	-321	-292
		1984-88	418	277.37	252.94	253.63	-37	-36
673.33	Iron and Steel Hot-Rolled Profiles	1979-82	2,397	470.46	440.40	401.49	-153	-351
		1984-88	851	329.21	411.39	352.18	212	59
673.36	Iron and Steel Simple Sheet Piling	1979-82	325	551.78	426.18	457.28	-74	-56
		1984-88	410	620.27	394.70	479.19	-149	-93
674.41	Heavy Plates of Iron or Simple Steel	1979-82	873	510.23	392.35	362.69	-202	-252
		1984-88	1,294	460.01	362.42	295.05	-275	-464
674.51	Medium Plates of Iron or Simple Steel	1979-82	664	497.01	345.67	448.18	-202	65
		1984-88	746	445.90	383.89	413.72	-104	-54
674.61	Rolled Thin Plate of Iron or Steel	1979-82	1,271	492.44	362.34	412.08	-336	-207
		1984-88	2,898	456.88	335.39	424.82	-771	-203
674.91	Other Iron and Steel Plates	1979-82	3,894	824.30	583.95	504.89	-1,135	-1,509
		1984-88	8,737	654.80	481.33	545.95	2,315	-1,452
676.01	Iron and Steel Railway Rails	1979-82	7,775	476.35	415.00	302.09	-1,001	-2,844
		1984-88	131	423.95	465.69	313.11	13	-34

[a] The calculations are based on the actual expenditure by Madagascar minus the expenditure that would have been required if Madagascar paid the same prices as other importers. Algebraically, the implied gain or loss (E_{ge}) is: $E_{ge} = p_f q_m - p_m q_m$

where p_f and p_m are prices paid by foreign and Madagascar importers and q_m is the quantity of Madagascar imports.

[b] The aggregate unit values have been computed using Madagascar's trade weights for the appropriate time period.

$$E_{ge} = \Sigma (p_f q_m - p_m q_m)$$

where P_f and P_m are the prices paid by other (foreign) traders and Madagascar, respectively, for French exports, and q_m is the quantity of the five-digit good imported by Madagascar. A negative value represents monetary losses caused by higher Madagascar prices while a positive value indicates a gain from relatively lower import prices.

The comparisons with other developing countries provide no evidence that Madagascar's relative import prices improved after PSI was adopted; a finding that matches the conclusions based on all imports (see Tables 2 through 4). In fact, Madagascar's relative prices rose to 23.5 percent above the average for other developing countries after PSI was required--up about 8-percentage points from average 1979-82 prices. The relative price differences imply expenditure losses for Madagascar of US$4.2 million--down from the 1979-82 losses of US$4.9 million on a considerably larger import base. Relative to the industrial countries, Madagascar's import prices were still 16 percent higher in the 1984-88 period although the associated expenditure losses declined by over 50 percent (to about US$2.8 million). To a large degree this was due to a compositional change in Madagascar's imports--particularly the reduction in iron and steel railway rails (SITC 676.01) where Madagascar was at a major competitive price disadvantage in 1979-82.[2] All in all, the evidence from Appendix Table 1 is

[2]For example, over 1979-82 Madagascar imported 16,322 tons of steel rails at an average price of US$476.35 per ton--as opposed to a price of US$302.09 for industrial countries. Had Madagascar imported this same quantity under the 1984-88 relative prices the implied expenditure loss would have been US$1.8 million rather than the US$34 thousand reported in the table. Appendix Table 1 shows that some 1984-88 unit values were lower than they were in 1979-82. This is due to the UN practice of converting all trade data to dollars, and the appreciation of the dollar against the French franc in the mid-1980s. In other words, French-franc prices rose from 1979-82 to 1984-88 but they appear lower in dollar terms.

consistent with previous findings that PSI did not significantly improve Madagascar's relative import prices.

Appendix 2

High and Low Tariff Products for Tests of False Invoicing by Industrial Country Exporters and Countries Covered by Madagascar's PSI Program

Appendix Table 2: High and Low Tariff Items Used in Analysis of False Invoicing of Madagascar's Imports

SITC(Rev.2)	Description	Tariff and Para-Tariffs (nominal rates) Average Tariff	Tariff Range Minimum	Tariff Range Maximum	Ave. Total Charges
I. HIGH TARIFF PRODUCTS					
01	Meat and preparations	6.1	5.0	10.0	106.1
03	Fish, crustaceans, etc.	3.6	0.0	15.0	101.7
05	Vegetables and fruit	9.1	0.0	20.0	101.9
06	Sugar and preparations	11.9	0.0	15.0	63.1
07	Coffee, tea, cocoa, spices	14.5	10.0	20.0	130.7
09	Edible products, nes	8.3	0.0	20.0	84.0
24	Cork and wood	0.9	0.0	5.0	70.7
41	Animal fat and oil	4.4	0.0	5.0	43.3
53	Dyeing and tanning material	3.4	0.0	10.0	40.4
55	Essential Oils	6.5	0.0	15.0	60.3
57	Explosives and pyrotechnics	7.3	5.0	15.0	48.0
61	Leather and dressed skins	6.2	5.0	10.0	45.2
625.2	New tires	7.5	5.0	10.0	40.5
63	Cork and wood manufactures	4.3	0.0	5.0	54.9
65	Textile yarn and fabrics	11.0	0.0	40.0	56.6
66(less 661.2)	Nonmetalic mineral manufactures	7.2	0.0	15.0	40.9
716.23	Generators with piston engines	10.0	10.0	10.0	41.0
741.5	Air conditioning machines	10.0	10.0	10.0	46.0
743.6	Gas, liquid filters, etc.	10.0	10.0	10.0	40.0
749.1	Ball and roller bearings	10.0	10.0	10.0	41.0
749.3	Transmission shafts	10.0	10.0	10.0	41.0
75	Office machines	10.5	9.0	15.0	47.6
76	Telecommunications equipment	5.0	5.0	5.0	63.2
776.4	Electronic microcircuits	5.0	5.0	5.0	65.0
781.0	Passenger motor vehicles	17.5	10.0	20.0	94.3
782.1	Lorries, trucks, etc.	12.0	10.0	20.0	56.8
784.9	Parts of motor vehicles	10.0	10.0	10.0	41.0
81	Sanity fixtures	7.0	5.0	10.0	43.4
82	Furniture and parts	8.6	5.0	10.0	94.3
83	Travel goods	10.0	10.0	10.0	85.0
84	Apparel	19.2	0.0	25.0	71.8
85	Footwear	10.0	10.0	10.0	59.1
88	Optical goods and watches	11.3	5.0	20.0	56.7
89(less 892.11)	Misc. manufactured goods	6.1	0.0	15.0	55.7
II. LOW TARIFF PRODUCTS					
022.42/3	Dry and powdered milk	2.5	0.0	5.0	14.5
041.1/2	Durum and other wheat	5.0	5.0	5.0	13.0
042.21	Milled rice	0.0	0.0	0.0	2.0
046.01	Flour of wheat	5.0	5.0	5.0	13.0
08	Animal feeds	5.0	0.0	10.0	11.7
12	Tobacco and manufactures	5.4	0.0	15.0	5.9
23	Crude rubber	0.0	0.0	0.0	15.0
32	Coal and coke	0.0	0.0	0.0	9.1
33	Petroleum products	0.2	0.0	5.0	14.7
34	Gas, natural and manufactured	0.0	0.0	0.0	7.8
56	Manufactured fertilizers	0.0	0.0	0.0	0.0
661.2	Cement	5.0	5.0	5.0	10.0
672.71	Iron and steel coils	0.0	0.0	0.0	12.0
723.9	Parts of construction machines	5.0	5.0	5.0	15.0
744.28	Other handling machines	5.0	5.0	5.0	15.0
782.2	Special purpose vehicles	10.0	10.0	10.0	13.0
79	Other transport equipment	3.5	0.0	10.0	16.3
892.11	Printed books	1.7	0.0	5.0	11.0

Source: UNCTAD, Handbook of Trade Control Measures of Developing Countries, (UNCTAD/DDM/Misc.2) (Geneva:UNCTAD, 1987), pp. 190-191. The UNCTAD source provides tariff data for all SITC Rev. 2 two-digit headings as well as for 100 most important five-digit products imported by developing countries.

Appendix Table 3: Countries in which Preshipment Inspection Occurs for Exports to Madagascar

Europe	Asia	Africa	The Americas
Austria	Bangladesh	Algeria[a]	Argentina
Belgium	Burma[a]	Egypt[a]	Bolivia
Bulgaria[a]	Hong Kong	Ghana	Brazil
Czechoslovakia[a]	India	Ivory Coast	Canada
Denmark	Indonesia	Kenya	Chile
F.R. Germany	Iran	Malawi	Colombia
Finland	Israel	Morocco	Costa Rica
France	Japan	Mozambique[a]	Cuba[a]
German D.R.[a]	Kuwait	Nigeria	Ecuador
Greece	Lebanon	Tanzania	El Salvador
Holland	Malaysia	Tunisia	Mexico
Hungary[a]	Pakistan	Zambia	Panama
Iceland	Philippines	Zimbabwe	Paraguay
Italy	Saudi Arabia		Peru
Luxembourg	Singapore		Puerto Rico
Malta	South Korea		Trinidad and Tobago
Norway	Sri Lanka		U.S.A.
Poland	Thailand		Uruguay
Portugal			Venezuela
Romania[a]			
Spain			
Sweden			
Switzerland[b]		Oceania	
Turkey		Australia	
United Kingdom		New Zealand	
Yugoslavia[a]			

[a] Countries in which SGS performs the quantity and quality inspection, but not the price comparison.

[b] Special Swiss system.

PRE Working Paper Series

	Title	Author	Date	Contact for paper
WPS596	The Mexican Sugar Industry: Problems and Prospects	Brent Borrell	February 1991	P. Kokila 33716
WPS597	Rent Sharing in the Multi-Fibre Arrangement: Theory and Evidence from U.S. Apparel Imports from Hong Kong	Refik Erzan Kala Krishna Ling Hui Tan	February 1991	G. Ilogon 33732
WPS598	Africa Region Population Projections: 1990-91 Edition	Patience W. Stephens Eduard Bos My T. Vu Rodolfo A. Bulatao	February 1991	O. Nadora 31091
WPS599	Asia Region Population Projections: 1990-91 Edition	Eduard Bos Patience W. Stephens My T. Vu Rodolfo A. Bulatao	February 1991	O. Nadora 31091
WPS600	Latin America and the Caribbean Region Population Projections: 1990-91 Edition	My T. Vu Eduard Bos Patience W. Stephens Rodolfo A. Bulatao	February 1991	O. Nadora 31091
WPS601	Europe, Middle East, and North Africa Region Population Projections: 1990-91 Edition	Eduard Bos Patience W. Stephens My T. Vu Rodolfo A. Bulatao	February 1991	O. Nadora 31091
WPS602	Firm Output Adjustment to Trade Liberalization: Theory with Application to the Moroccan Experience	Mark A. Dutz	February 1991	S. Fallon 38009
WPS603	The Role of Officially Supported Export Credits in Sub-Saharan Africa's External Financing	Asli Demirgüç-Kunt Refik Erzan	February 1991	G. Ilogon 33732
WPS604	Foreign Trade and Its Relation to Competition and Productivity in Turkish Industry	Faezeh Foroutan	February 1991	S. Fallon 37942
WPS605	Overview of Contractual Savings Savings Institutions	Dimitri Vittas Michael Skuliy	March 1991	W. Pitayato-nakarn 37666
WPS606	Adjustment Policies and Investment Performance in Developing Countries: Theory, Country Experiences, and Policy Implications	Luis Serven Andrés Solimano	March 1991	E. Khine 39361

PRE Working Paper Series

	Title	Author	Date	Contact for paper
WPS607	Abolishing Green Rates: The Effects on Cereals, Sugar, and Oilseeds in West Germany	Donald F. Larson Simon Glance Brent Borrell Merlinda Ingco Jonathan Coleman	March 1991	D. Gustafson 33714
WPS608	Cross-Country Studies of Growth and Policy: Methodological, Conceptual, and Statistical Problems	Ross Levine David Renelt	March 1991	CECMG 39175
WPS609	A Sensitivity Analysis of Cross-Country Growth Regressions	Ross Levine David Renelt	March 1991	CECMG 39175
WPS610	Can Preshipment Inspection Offset Noncompetitive Pricing of Developing Countries' Imports? The Evidence from Madagascar	Alexander J. Yeats	March 1991	J. Jacobson 33710